

Applicants : Maurice Husson, Christian Jacquemet and Eugene Vorobiev
Appl. No. : 10/520,471
Filed : January 7, 2005

REMARKS

Claims 9-31 were pending and under examination in the subject application. By this amendment, Claim 9 has been amended and Claims 14 and 15 have been canceled. The amendments to Claim 9 are supported by the application as filed including, for example, cancelled Claims 14 and 15 and do not introduce new matter. The amendments to Claim 9 are believed to place the application in condition for allowance or better form for appeal. Accordingly, entry of the amendments is respectfully requested.

In view of the remarks which follow, applicants respectfully request reconsideration and withdrawal of the various rejections set forth in the October 26, 2010 Office Action, and passage of the claims to allowance.

35 U.S.C. 103 Rejection

Claims 9-31 were rejected under 35 U.S.C. 103 as unpatentable over Virtanen (WO 97/38940) (“Virtanen”) in view of Bleakley, et al. (U.S. Patent No. 5,833,747) (“Bleakley”) and Izaki, et al. (U.S. Patent No. 3,970,639) (“Izaki”). This rejection is respectfully traversed.

None of the cited references, alone or in combination, teaches or suggests a process for the preparation of a concentrated cake comprising performing two separate stages of filtration, wherein in the first filtration stage, a pre-layer of mineral matter is formed on a filtration membrane in the absence of a dispersant agent, and in the second filtration stage, which is operated continuous to the first filtration stage, the pre-layer of mineral matter from the first filtration stage is treated on the filtration membrane with a second aqueous suspension containing a dispersant agent to obtain a filtrate and a concentrated cake, wherein the quantity of the dispersant agent in the filtrate is controlled and limited by a continuous measurement of the electrical conductivity of the

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filtrate, and wherein the second filtration stage is stopped as soon as the electrical conductivity of the filtrate increases.

In the Office Action, the Examiner acknowledged that Virtanen does not teach a second filtration stage which is operated continuous to the first filtration stage. In addition, the Examiner acknowledged that Virtanen does not teach controlling the amount of the dispersant in the filtrate by measurement of the electrical conductivity of the filtrate, and stopping as soon as the conductivity increases. With respect to the continuous operation of the first and second filtration stages, the Examiner argued that it would have been obvious because: 1) selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results (citing to *In re Burnhans*, 154 F.2d 690, 69 USPQ (CCPA 1946); *In re Gibson*, 39 F.3d 975, 5 USPQ 230 (CCPA 1993); and 2) the same result is produced in the absence of any evidence to the contrary. In this regard, the Examiner stated that it appears that all applicants have done is to re-order the filtration steps to obtain the concentrated cake. With respect to the measurement of the electrical conductivity, the Examiner argued that this deficiency in Virtanen is cured by the teachings of Bleakley.

In response, it is noted that the claimed invention is simply not a reordering of process steps disclosed in Virtanen that results in a *prima facie* case of obviousness. Rather, Virtanen discloses a specific multistep process for the preparation of PCC that specifically requires the separation of NaOH from calcium carbonate precipitate, washing of the PCC together with carbon dioxide treatment, an optional although preferred neutralization of the PCC with an acid, and a two part dispersion step (where some dispersant is added to the cake and the remainder is introduced after the cake has been resuspended). There is no teaching or suggestion in Virtanen that the washing step and treatment with calcium dioxide can be eliminated. In fact, these are essential steps in the process of Virtanen. In addition, Virtanen teaches that the final

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neutralization with an acid is preferred before the addition of the dispersant. Accordingly, based on the teachings of Virtanen, one skilled in the art would not arrive at the two separate stages of filtration of the claimed invention, wherein in the first filtration stage, a pre-layer of mineral matter is formed on a filtration membrane in the absence of a dispersant agent, and in the second filtration stage, which is operated continuous to the first filtration stage, the pre-layer of mineral matter from the first filtration stage is treated on the filtration membrane with a second aqueous suspension containing a dispersant agent to obtain a filtrate and a concentrated cake. Virtanen does not establish that the claimed invention is *prima facie* obvious.

The addition of Bleakley does not remedy the deficiencies in Virtanen, and in fact, supports the unobviousness of the present invention. In this regard, Bleakley describes the dispersion of PCC by redispersion of the partially dewatered calcium carbonate in water containing the dispersing agent in a high shear mixer to give the fluid suspension containing the calcium carbonate. Therefore, using the teachings of Bleakley as a guide, the skilled artisan would chose to combine the dispersion agent and the calcium carbonate in a fluid suspension in a high speed mixer, and not to perform a second filtration stage continuous to a first filtration stage, in which the pre-layer of mineral matter formed from the first filtration stage is treated on the filtration membrane with a second aqueous suspension containing a dispersant agent.

With respect to the controlling the measurement of the electrical conductivity, applicants believe the Examiner is incorrect. Bleakley does not teach or suggest controlling the quantity of a dispersant agent in a filtrate by a continuous measurement of the electrical conductivity of the filtrate, and stopping the second filtration stage is stopped as soon as the electrical conductivity of the filtrate increases.

The addition of Izaki does not remedy the deficiencies in Virtanen and Bleakley. In this regard, Izaki describes a composition for paper coating and does not

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describe filtration whatsoever. In addition, Izaki, like Virtanen and Bleakley, does not teach or suggest controlling the quantity of a dispersant agent in a filtrate by a continuous measurement of the electrical conductivity of the filtrate, and stopping the second filtration stage is stopped as soon as the electrical conductivity of the filtrate increases.

In accordance with U.S. Patent law, a determination of obviousness is based on a consideration of the prior art as a whole. In this regard, the "critical inquiry" is whether the prior art as a whole suggests the desirability (and therefore the obviousness) of the combination. *Fromson v. Advance Offset Plate*, 755 F.2d 1549 (Fed. Cir. 1985)(the claimed process was patentable over the cited art since the cited art as a whole did not suggest the desirability of the combination of certain processing steps). If the prior art as a whole is considered, it should be clear that the claimed invention is not obvious. As discussed on page 1 of the present application, to accomplish the various industrial uses of mineral suspensions, it is necessary to produce suspensions of mineral loads with excellent rheology, i.e. with a low viscosity during the period of storage to facilitate manipulating and application, and as high as possible a mineral content, in order to reduce the quantity of water handled (page 1, lines 18-22). During production of the aqueous mineral suspensions, some processes lead to weakly concentrated aqueous suspensions that must be concentrated to offer them to the end user (page 1, lines 24-30). Filtration is one of the means known to concentrate suspensions. However, filtrations have led to cakes which are so compact that a dispersant is typically used after the filtration stage, followed by the use of high mechanical energy to return the cakes to suspension (page 1, lines 32-36). This is, in fact, what Bleakley teaches (i.e., redispersion of the partially dewatered calcium carbonate in water containing the dispersing agent in a high shear mixer to give the fluid suspension containing the calcium carbonate). Other techniques are also described in the art, and include, for

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example, (1) filtering suspensions without any dispersant (page 2, lines 9-13); (2) the introduction of half the dispersant before filtration and the other half after the filtration stage (page 2, lines 15-18); or (3) the use of a dispersant before concentration by filtration in a single stage (page 2, lines 20-24). As an alternative, Virtanen describes a two stage dispersion step, whereby most of the dispersing agent is added to the filtered cake in the filter, and the rest is added while the filtered cake is suspended (see, page 8, lines 13-15). In view of the prior art, the skilled artisan would choose one of the known methods of introducing a dispersant into the mineral filler. The prior art simply does not teach or suggest the desirability of performing two separate stages of filtration of the claimed invention, wherein in the first filtration stage, a pre-layer of mineral matter is formed on a filtration membrane in the absence of a dispersant agent, and in the second filtration stage, which is operated continuous to the first filtration stage, the pre-layer of mineral matter from the first filtration stage is treated on the filtration membrane with a second aqueous suspension containing a dispersant agent to obtain a filtrate and a concentrated cake. In addition, the prior art does not teach the claimed process in which the quantity of the dispersant agent in the filtrate is controlled and limited by a continuous measurement of the electrical conductivity of the filtrate, and wherein the second filtration stage is stopped as soon as the electrical conductivity of the filtrate increases. The claimed invention, based on the prior art as a whole, is not obvious.

For these reasons, applicants maintain that the claimed invention is patentable over Virtanen in view of Bleakley and Izaki. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

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No fee is deemed necessary in connection with the filing of this response.
If any additional fee is required to preserve the pendency of the subject application,
authorization is hereby given to charge the amount of any such fee to Deposit Account
No. 01-1785.

Respectfully submitted,

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